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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,759	07/26/2007	Ardythe L. Morrow	50051-002US1	6591

69713 7590 06/09/2010
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EXAMINER

MAIER, LEIGH C

ART UNIT	PAPER NUMBER
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1623

NOTIFICATION DATE	DELIVERY MODE
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06/09/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/581,759	Applicant(s) MORROW ET AL.	
	Examiner Leigh C. Maier	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-37 and 59-77 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 33,36,37 and 59-77 is/are rejected.
- 7) ☒ Claim(s) 34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Status of the Claims

Claims 38, 39 and 58 are canceled. Claims 64-75 are newly added. Claims 33-37 and 59-75 are pending and under examination. Any objection or rejection not expressly repeated has been withdrawn. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 33, 36, 37 and 59-61 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for treatment/prevention of infection comprising an oligosaccharide, such as 2'FL or 2'FLNAc – known to be beneficial in this sort of therapy – in combination with one having a fucose with an α 1,3 or α 1,4 linkage to a galactose does not reasonably provide enablement for this method using a molecule having a fucose with an α 1,3 or α 1,4 linkage to a galactose as the minimum requirement. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

Many of the factors regarding undue experimentation have been summarized in *In re Wands*, 858 F.2d 731, 8 USPQ2d 1400 (Fed. Circ. 1988) as follows:

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- (1) The quantity of experimentation necessary (time and expense);
- (2) The amount of direction or guidance presented;
- (3) The presence or absence of working examples of the invention;
- (4) The nature of the invention;
- (5) The state of the prior art;
- (6) The relative skill of those in the art;
- (7) The predictability or unpredictability of the art; and
- (8) The breadth of the claims.

The claims are drawn to a method of treating or reducing the risk of infection comprising administering a composition containing a molecule including a fucose group in an α 1,3 or α 1,4 linkage to a galactose, a very broad genus of compounds. The specification concentrates on those known species of oligosaccharides shown in the art to be found in human milk. The disclosure further discusses those similar in structure, but these are only described generically, as in instant claim 33. Of all the many oligosaccharide species disclosed, Applicant has not identified, much less tested or even suggested a dosage range for, a single species having this type of fuc-gal linkage. Therefore, the guidance with respect to this embodiment is lacking.

The state of the art is such that it is known that a wide variety of oligosaccharides and glycoconjugates are found in human milk and that these compounds are useful for the prevention of the adhesion of microorganisms to cells, as discussed in the Prieto references below. However, there do not appear to be any known oligosaccharides derived from milk having this particular epitope.

It is also known that the basis for the oligosaccharides' ability to inhibit adhesion is the recognition of the oligosaccharides by infectious agents. The interaction between oligosaccharides and microorganisms is highly dependent on the structure of the oligosaccharide, and small changes in structure can lead to very large changes in the interaction with the microorganism. For example, Magnusson et al (US 5,474,986) teaches that galabiose derivatives

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can be used for reducing bacterial infection. However, Table I demonstrates how small structural changes can greatly change the activity of the compound. Going from gal α 1-4gal β -OR (compound 1) to fuc α 1-4gal β -OR (compound 8) results in a nearly 95% decrease in activity. This demonstrates how unpredictable the art is. The fact that an oligosaccharide has a somewhat similar structure to one known for a particular activity is not the basis for a reasonable expectation that the hypothetical oligosaccharide will have the same activity as the known one.

In view of the foregoing, it is deemed that one of ordinary skill would require undue experimentation in order to use the invention commensurate with the scope of the claim.

Claim Rejections - 35 USC § 102

Claims 70-77 are rejected under 35 U.S.C. 102(b) as being anticipated by Prieto et al (US 6,045,854).

Prieto '854 discloses the administration of a synthetic nutritional formulation to infants. The composition comprises various oligosaccharides found in human breast milk. See col 3, lines 18-60 and examples. The administration of the composition inherently reduces the risk of infection. The reference recognizes that these oligosaccharides are known for protecting infants from infection. See col 1, lines 62-64. With respect to treatment, the administration of the nutritional composition would be continued even if the infant were ill, so the treatment method would be accomplished.

Claim Rejections - 35 USC § 103

Claims 62-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto et al (US 2002/0019991).

Prieto '991 discloses the administration of a composition comprising at least one glycan comprising a fucose in an α 1,2 linkage for the prevention or treatment of enteric infections, *V. cholerae* or *E. coli*. See particularly paragraphs [0028]-[0034]. The glycan entities include glycoproteins and glycolipids.

The reference is particularly drawn to the prevention and treatment of *V. cholerae* and *E. coli* and does not specifically address prevention and treatment of *C. jejuni*. However, the reference specifically discloses avid binding (indication of utility in prevention/treatment of pathogen) with some of the described oligosaccharides, particularly H-2 (Fuc α 1-2Gal β 1-4GlcNAc). See example I.

The reference does not particularly disclose a composition or conjugate having more than one oligosaccharide. However, the reference specifically suggests compositions and glycoconjugates (including glycoproteins) having “*at least one* fucose residue in an α 1-2 linkage.” (emphasis added) See for example, paragraph [0031].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a composition disclosed comprising H-2 for the prevention/treatment of *C. jejuni* and *E. coli* with a reasonable expectation of success because the reference discloses strong binding of *C. jejuni* and *E. coli* with this oligosaccharide. Finally, it would be further obvious to prepare compositions or glycoconjugates, including glycoproteins, having more than one of the recited oligosaccharides with a reasonable expectation of success because it is

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suggested by the art. The risk of infection from the other newly recited pathogens would similarly be reduced in carrying out this method.

Applicant's arguments filed February 22, 2010 have been fully considered but they are not persuasive. Applicant argues that the examiner has misinterpreted paragraph [0030] in concluding that the reference suggests conjugates having more than one oligosaccharide. Applicant states that "a skilled person in the art would have readily known that the phrase 'include at least one fucose residue in an α 1,2 linkage' used in paragraph [0030] describes a particular family oligosaccharides, each member having one or more fucose residues; it does not relate to any molecule containing two or more oligosaccharide moieties." It appears that Applicant is interpreting this as if it read that the composition "includes at least one fucose, one of which is in an α 1,2 linkage." The examiner does not agree that this is the most reasonable interpretation of this passage. A composition comprising "at least one fucose residue in an α 1,2 linkage" clearly contemplates one having "more than one fucose residue in an α 1,2 linkage."

It is further noted that it was paragraph [0031], not [0030], that was cited to suggest multiply substituted conjugates. That paragraph recites "the present invention also comprises compositions comprising analogues which mimic the fuc α 1,2 epitope in such a way that their affinity for the carbohydrate binding domain of enteropathogenic bacteria is equal to or greater to or greater than the compositions described above [suggesting the composition described in paragraph [0030]] comprising at least one fucose residue in an α 1,2 linkage." This paragraph also suggests the use of glycoproteins, known typically to have multiple glycosyl moieties.

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Allowable Subject Matter

Claims 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Prieto references teach as set forth above. The references do not teach or fairly suggest the administration of a composition comprising 2'FL or 2'FLNAc that further comprises a molecule having a fucose group in an α 1,3 or α 1,4 linkage to a galactose.

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Examiner's hours, phone & fax numbers

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh Maier whose telephone number is (571) 272-0656. The examiner can normally be reached on Tuesday, Thursday, and Friday 7:30 to 4:00 (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Anna Jiang (571) 272-0627, may be contacted. The fax number for Group 1600, Art Unit 1623 is (571) 273-8300.

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/Leigh C. Maier/
Primary Examiner
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